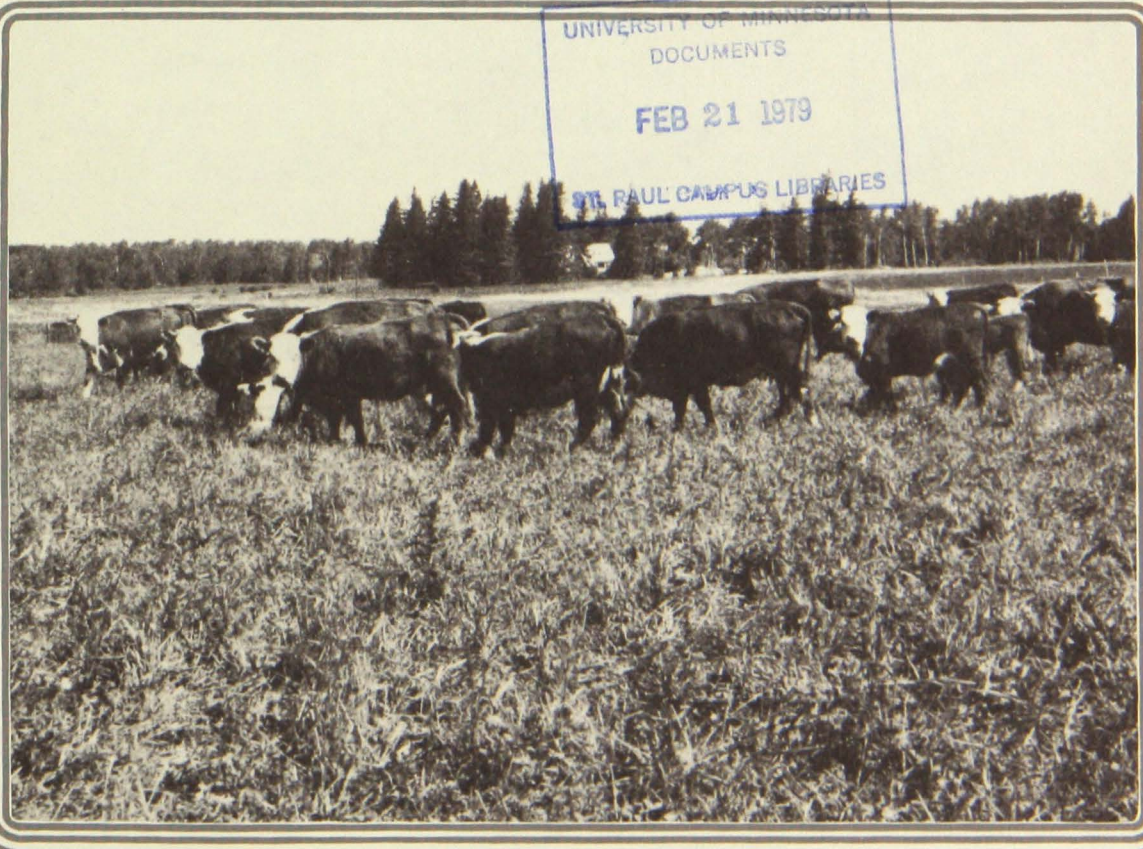
Extension Bulletin 438-1978

# THE MINNESOTA BEEF COW-CALF INDUSTRY

## and Analysis of Management Practices







AGRICULTURAL EXTENSION SERVICE

UNIVERSITY OF MINNESOTA

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# The Minnesota Beef Cow-Calf Industry and Analysis of Management Practices

## INTRODUCTION

Twenty percent of Minnesota's farms or ranches had a beef cow-calf enterprise in 1977. Conservatively valued, the calf crop produced that year was worth over $130,000,000. The beef cow herd, while a supplemental income in most operations, is a sizable part of family income on many farms and ranches.

The Minnesota Agricultural Extension Service provides numerous programs of education and information for beef producers. Extension attempts to meet the needs of people in their agricultural and related enterprises.

The challenge to determine producer needs plus the support of the Upper Great Lakes Regional Commission provided the impetus for conducting the study reported in this bulletin. The University of Minnesota Agricultural Extension Service and Upper Great Lakes Regional Commission have cooperated on a beef cow-calf demonstration farm program in northern Minnesota. As part of this project, a statewide survey of beef cow-calf enterprises and the management practices used has been completed. Part of that analysis is presented here. The purpose is to assist Extension and individual producers in determining which production practices may need attention in Extension educational programs and on the farm to assist in developing a growing beef cow-calf industry in Minnesota.

# THE PRESENT BEEF SITUATION

There is a beef cow-calf enterprise on one in five of Minnesota farms or ranches (23,325 out of a total of 117,000, January 1977). The Minnesota beef cow-calf industry has gone through a difficult period from 1974-1977. Cow-calf operators suffered four years of large financial losses because of several factors: 1) high feed prices, 2) overexpansion in cow numbers in the U.S. prior to 1974, 3) high cattle slaughter, and 4) the 1976 drought in the Upper Midwest. Each of these has contributed to push and hold feeder production costs over feeder market prices.

Between 1970 and 1974 beef cow numbers in Minnesota increased dramatically, reaching 700,000 head on January 1, 1974. These were years of relatively high feeder cattle prices that encouraged overexpansion in the national cow herd.

**Table 1. Beef cow numbers in Minnesota (January 1 inventory)**

| | |
|---|---|
| 1970 | 493,000 |
| 1974 | 700,000 |
| 1975 | 739,000 |
| 1976 | 751,000 |
| 1977 | 640,000 |
| 1978 | 550,000 |

The world-wide feed grain shortage developed in 1973 and 1974 resulting in sharply higher grain prices. Higher feed grain prices meant higher feedlot costs and lower bid prices for feeder cattle. In the following two years, 1974-75, because of the sharp drop in feeder prices, the cow population in the state increased by only 51,000 head. Prices for choice feeder calves at Kansas City dropped from a January 1974 price of $54.66/cwt. to a low of $25.55/cwt. on the following January. Prices averaged $32.50 in 1975. These low prices were insufficient to even cover the feed costs of keeping beef cows, setting the stage for the sharp reduction in cow numbers in 1976 and 1977.

The 1976 drought added strain to Minnesota cow-calf operations. Minnesota has been traditionally considered a state which produces surplus forage. However, since 1974, hay production has been marginal, at best. Hay stocks on farms were short in 1975 and 1977. In 1974, production was low because of a 5 percent drop in hay acreage. Although hay stocks listed in early 1976 appeared normal, the drought that year required that some of this hay be fed to replace short pastures.

**Table 2. Total hay production and hay stocks in Minnesota**

| Year | All hay production 1,000 Tons[1] | Hay stocks on farms, May 1[2] 1,000 Tons |
|---|---|---|
| 1973 | 8,007 | 1,551 |
| 1974 | 7,496 | 1,201 |
| 1975 | 8,005 | 974 |
| 1976 | 5,765 | 1,521 |
| 1977 | 8,136 | 922 |
| 1978 | N.A. | 1,627 |

1) Field Crops, Crop Reporting Service, USDA-SRS, 1976 & 1977
2) Crop Production, Crop Reporting Service, USDA-SRS, 1976

Low hay stocks during 1975, 1976, and into 1977 increased prices for average quality hay in Minnesota. Average hay prices which historically ranged between $16 and $23/ton rose to an average of $76/ton in January 1977. These high prices and short forage supplies accelerated the cow herd reduction in 1976 and 1977. The Minnesota calf crop in 1978 is expected to be 76 percent lower than it was in 1974.

The outlook for the cow-calf industry in Minnesota depends on several factors including:

(1) U.S. cattle number changes during the next few years

(2) Feed grain prices

(3) Forage supplies and prices

U.S. cattle numbers have decreased by about 20 million head since their peak on January 1, 1975. Feed grain prices declined significantly after the good world-wide crops in 1976 and 1977. Forage production increased in 1977 and additional increases are expected in 1978. The lower cattle supplies and reduced feedlot costs gave rise to sharply higher feeder prices in the spring of 1978. The combination of higher feeder prices and low cow maintenance costs will result in greatly improved earnings from the cow herd in 1978. It now appears that cattle numbers have declined enough so that cattle prices will be high enough to make the cow herd a profitable enterprise again. Prospects for cow-calf operations look more favorable in the next few years.

A year ago many of the feeder calf producers in the state were not optimistic about the future. A large number of the producers responding to the Extension Service

survey in the winter of 76/77[1] had either liquidated their cow herds, intended to liquidate, or intended to reduce their herd size in the immediate future. The January 1, 1978, cow numbers indicate that these plans were carried out. Cow number reductions were the greatest in western Minnesota where the drought was most severe. (See Appendix for cow numbers by counties 1974-1978). However, it is likely that improved feed supplies and profit prospects will lead to a change of attitudes and a rebuilding of cow herds in the 1979-84 period. Then, if history repeats itself for the eighth time in this decade, overexpansion will again result in low prices and profits leading to another liquidation of cattle numbers in the 1985-87 period.

[1]Minnesota Extension Service 1977 Cow-Calf Producer Survey.

# AGRICULTURAL EXTENSION PROGRAM INVOLVEMENT WITH THE COW-CALF INDUSTRY

Over the years, the Minnesota Agricultural Extension Service has been heavily involved in educational activities that have served the feeder calf producers of the state. Special Extension reports, fact sheets, annual cow-calf reports, and the *Northern Minnesota Beef News* have all been aimed at serving the educational needs of producers and others associated with Minnesota's beef industry. In addition, there have been held annually area and county cow-calf educational days, livestock outlook meetings, and beef performance test educational meetings in all regions of Minnesota. Also, the Extension Service is heavily involved in the administration of the Northern Minnesota Beef Cow-Calf Demonstration Project which presently involves eight privately owned demonstration farms throughout northern Minnesota. Related research is conducted at the University Experiment Stations at Rosemount, Morris, Grand Rapids, and Crookston. The sum of these and individual efforts comprise Extension's efforts to serve the state's cow-calf producers and related clientele.

# THE SURVEY

The Minnesota Agricultural Extension Service develops educational and informational programs with and for the people they serve. An ongoing effort is made to determine the needs and interests of these people. County and area Extension agents, state Extension specialists, and others use survey methods to determine the actual situation farmers and ranchers are facing as they make management and technical decisions. Knowing the details of what problems exist and what practices are being used is the first step in designing effective Extension programs. With this in mind, a survey of Minnesota cow-calf producers was designed and conducted in the winter of 1976/77. Its purposes were:

1) To describe the nature of Minnesota's beef cow-calf industry.
2) To identify management practices that need attention in Extension educational programs.

The support of the Upper Great Lakes Regional Commission made possible the conduct of this study relating to the present status of the beef cow-calf industry in Minnesota. With these study results as a bench mark, educational programs can be planned, carried out, and evaluated both annually and long range.

## Survey Background

A survey was designed to determine the nature of Minnesota's beef enterprises. Questions used in the survey originated from University of Minnesota Agricultural Extension Service specialists. After the submitted questions were thoroughly discussed on several occasions by members of the Minnesota Extension Beef Cow-Calf Subcommittee, they were pretested in a mail-out survey with a sample size of 184 farmers-ranchers. A series of personal interviews to test the survey form was done with 10 farmers in Redwood and Kanabec counties. Questionnaire format and individual questions were adjusted as a result of these two pretests.

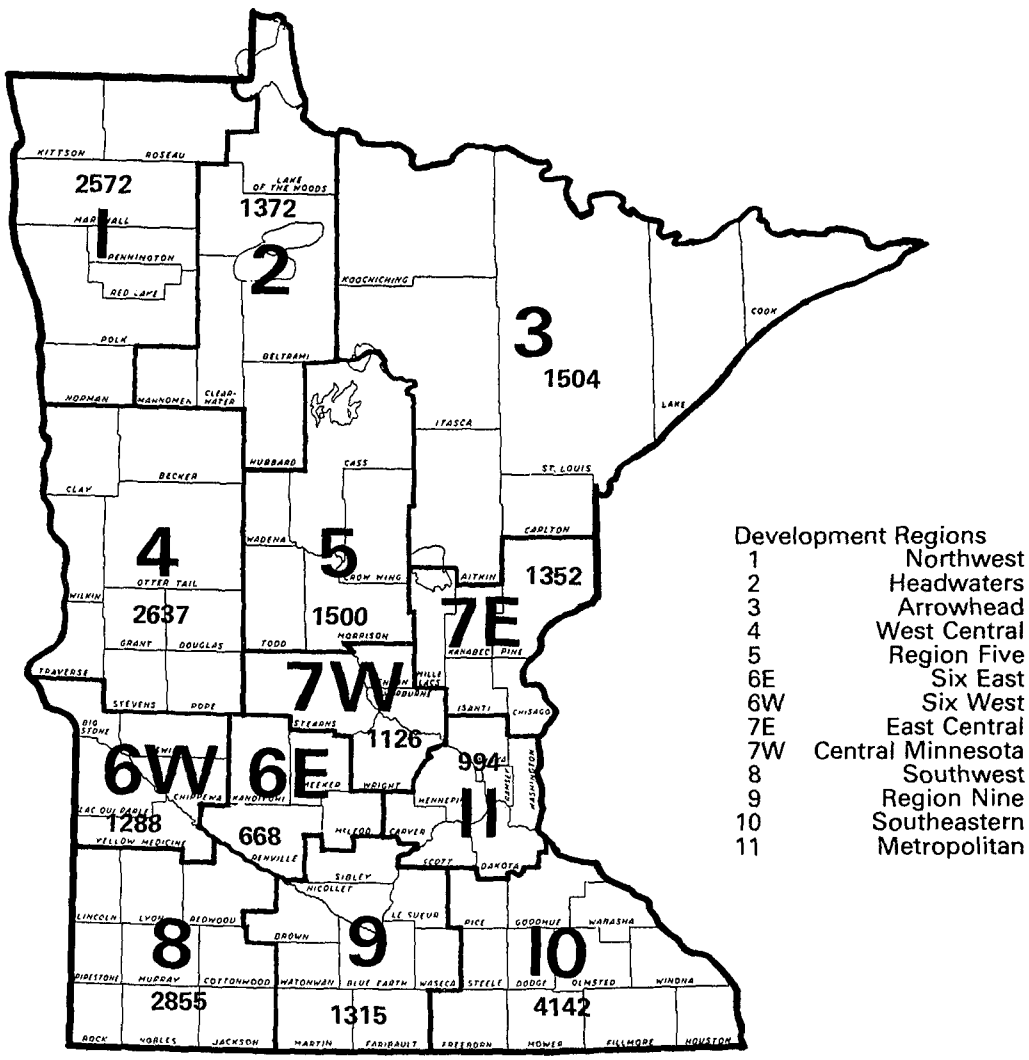



**Figure 1. Beef cow herds by Minnesota development regions — 1976**

The final questionnaire schedule consisted of a preliminary letter to each farmer-rancher scheduled to receive a questionnaire. Each farmer was mailed a 3½-page, 46-question form accompanied by a University of Minnesota beef cow-calf management calendar. Two follow-up reminder letters were sent to nonrespondents.

The total field from which the samples were drawn was all of the known beef cow operations in Minnesota, which as of January 1977 were approximately 23,000 production units. About a quarter of the 23,000 beef cow-calf operations in Minnesota were contacted for the survey. The samples were drawn from each of 13 state economic development regions so that analysis of Minnesota's beef cow-calf industry could be conducted on a regional basis. A minimum of 300 farmers in each region was contacted. Figure 1 illustrates the numbers of herds in each development region.

## Survey Response

There was an approximate 50 percent response to the mail survey; however, only about 35 percent of the returns were usable. Several forms were returned incomplete; others indicated they were no longer in the beef cow-calf business. There were 1,409 complete, usable schedules entered into the analysis.

For analysis purposes and for later Extension program development, the regions were combined on a "type of farming" basis. This is shown on the map in figure 2. All analyses that follow in this report relate to the areas designated in this figure, (NW, NE, WC, SW, SC, SE, and statewide). Numbers of herds and herds sampled are given on the figure 2 map.

Data presented in tables in this report derive from the total numbers, sample drawn, and ultimate response shown in table 3. The data that follow are presented in straight percentage distribution.

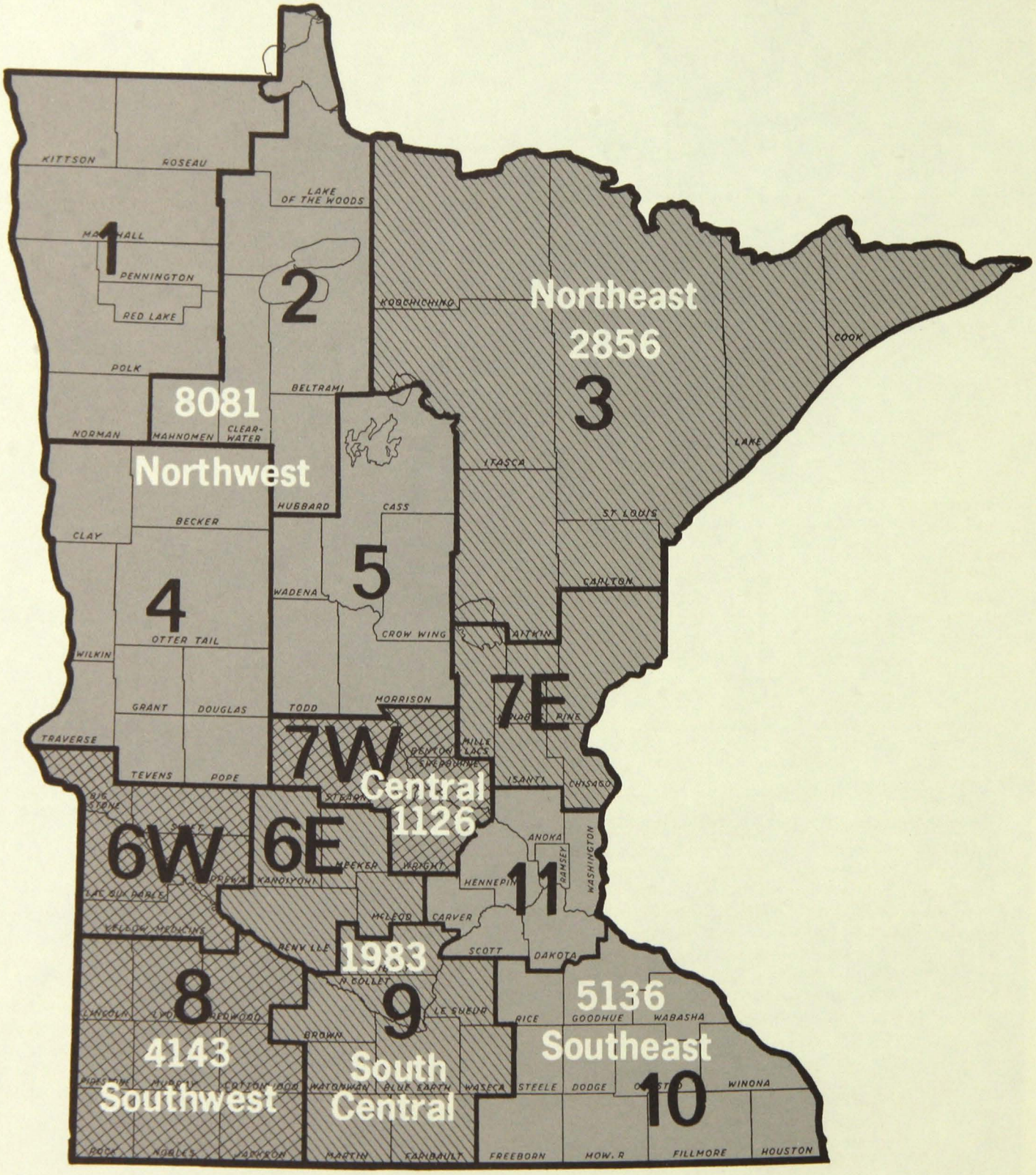



**Figure 2. Minnesota beef enterprise survey areas showing number of herds in each area**

**Table 3. Survey response pattern**

| | State | Selected type of farming regions NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Total herds in area[1] | **23325** | 8081 | 2856 | 4143 | 1983 | 5136 | 1126 |
| Valid surveys mailed[2] | **3898** | 1171 | 567 | 607 | 565 | 700 | 288 |
| Surveys usable in analysis[3] | **1409** | 401 | 246 | 200 | 204 | 255 | 103 |

[1] As determined from county data - Minesota Agricultural Statistics 1976
[2] Twenty percent random sample drawn, corrected for missing names, deceased, or residents who have moved
[3] Returned surveys that were filled out in their entirety and used in the data analysis summarized in this report

# *MINNESOTA BEEF ENTERPRISES– THEIR NATURE*

On the basis of this statewide survey it is possible to make observations about the general nature of Minnesota's farm and ranch beef industry.

Based on this survey, the approximately 23,000 cow-calf production units show characteristics of size of herd, trend in size of herd, land used for beef, relative amounts of income from the beef enterprise plans, and limitations for expansion.

In addition to a general description of the enterprise, the production and marketing practices being used by decision markers at the farm-ranch level are also described in some detail. Practices studied and evaluated here are those that Extension specialists say have a bearing, in some manner, on incomes and profitability in cow-calf operations. They are under the control of the operator or manager and thus are subject matter topics for Extension educational programs.

## Economic Importance of Beef Cow Herds

Minnesota ranks among the top ten U.S. states in cattle and calves on farms and ranches as well as cattle and calves marketed. When the value of the product is considered, the cow-calf industry is a significant part of Minnesota agriculture. Using the average Minnesota cow herd of the past five years — 678,000 cows — and an 88 percent calf crop weaned at an average of 400 pounds per calf, and assuming an average feeder calf price of 55 cents per pound (1977 suggested planning prices), this cow-calf industry would provide $131,261,000 of gross value produced in the state.

Minnesota ranks fifth among U.S. states in production of hay, a major component of beef cow herd rations. There are 3.0 to 3.25 million acres of hay harvested annually in Minnesota. Average yields fluctuate around 2.5 tons per acre. The annual farm value of hay produced in recent years was approximately $400,000,000.

Pasture land, particularly in northern Minnesota, is an important input into the beef cow-calf enterprises. Much of that area produces forage in comparative advantage to other crops. Beef cows utilize pastures very well, and these pastures respond positively to good management practices.

## Numbers

Minnesota Crop and Livestock Reporting Service data show the following numbers of beef cows in the six designated areas of this survey. Cow numbers by county 1974-78 are shown in the Appendix.

The survey areas are not uniform in size. Specialists designated the areas as having some similarity within. This was thought to be useful in identifying specific problems and opportunities for development of the industry and development of Extension programs. See table 5 for the number of herds in each of the survey areas in 1976/77.

**Table 5. Farms-ranches with beef cows by area surveyed**

| | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1976/77 | **23,325** | 8081 | 2856 | 4143 | 1983 | 5136 | 1126 |

## Size of Herd

As previously indicated, Minnesota producers were reducing the size of or liquidating herds in the 1975 to 1977 period. The data in table 6 reflect this trend to smaller herd sizes with every area of the state showing a much higher proportion of cow herds with less than 20 cows in 1977 than in 1975.

**Table 4. Beef cow numbers by areas surveyed**

| Year | Statewide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1977 | **640,000** | 215,000 | 57,700 | 136,700 | 51,300 | 153,400 | 25,100 |
| 1976 | **752,000** | 263,400 | 66,700 | 167,000 | 56,900 | 170,900 | 27,200 |
| 1975 | **739,000** | 244,100 | 67,100 | 156,100 | 58,800 | 184,100 | 28,800 |
| 1974 | **708,000** | 224,000 | 62,200 | 139,000 | 63,600 | 190,800 | 28,400 |

Source: Annual Minnesota Agricultural Statistics - Minnesota Crop-Livestock Reporting Service

**A typical Minnesota beef herd.**

**Table 6. Percentage of cows by herd size groups, three-year period 1975-77***

| 1975 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Number of cows | State | NW | NE | SW | SC | SE | Central |
| (Herd size) | % | % | % | % | % | % | % |
| 1-20 | **37** | 36 | 46 | 23 | 48 | 35 | 51 |
| 21-40 | **33** | 31 | 30 | 42 | 31 | 32 | 34 |
| 41-100 | **22** | 24 | 20 | 22 | 18 | 26 | 13 |
| 101-200 | **6** | 7 | 3 | 12 | 2 | 5 | 2 |
| 201+ | **2** | 2 | 1 | 1.1 | 1 | 2 | – |

| 1976 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Number of cows | State | NW | NE | SW | SC | SE | Central |
| (Herd size) | | | | | | | |
| 1-20 | **39** | 38 | 51 | 23 | 50 | 37 | 47 |
| 21-40 | **31** | 28 | 26 | 41 | 30 | 31 | 39 |
| 41-100 | **24** | 27 | 20 | 25 | 17 | 26 | 12 |
| 101-200 | **5** | 5 | 3 | 10 | 2 | 4 | 2 |
| 201+ | **1** | 2 | – | – | 1 | 2 | – |

| 1977 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Number of cows | State | NW | NE | SW | SC | SE | Central |
| (Herd size) | | | | | | | |
| 1-20 | **47** | 45 | 63 | 35 | 60 | 41 | 57 |
| 21-40 | **28** | 27 | 23 | 35 | 24 | 29 | 32 |
| 41-100 | **21** | 23 | 13 | 24 | 14 | 25 | 8 |
| 101-200 | **3** | 3 | 1 | 6 | 2 | 3 | 3 |
| 201+ | **1** | 2 | – | – | – | 2 | – |

*numbers in these and subsequent tables have been rounded.

There is a wide variation in the size of beef cow herds on farms and ranches in Minnesota. At the time of the survey on a statewide basis, 47 percent of the herds were less than 20 cows and approximately 5 percent of the herds consisted of over 100 cows. The variation in herd size by area as shown in table 5 above has some implications for Extension programming.

## Economic Significance of the Beef Enterprise in the Farm-Ranch Operations

A beef cow-calf enterprise may be a major source of family income or it may be a supplementary, relatively minor enterprise on a farm. At the time of this survey, Minnesota beef cow herd owners were making adjustments in their enterprises. Because of a series of unprofitable years, many were selling out or reducing size of units. This reduction phase followed a period of expansion in the early 1970's. Southern Minnesota farms with other options for crop production contrast with northern Minnesota areas where forage is the main and perhaps optimum crop. Decisions on when beef cows fit in the farm business organization are influenced by many of these factors.

Table 7 lists the gross sales from the beef cow-calf enterprises as a percent of total farm or ranch sales by survey area.

A second variable that is associated with the economic importance of beef cow-calf operations in Minnesota and in local areas is the relative place the farm-

**Table 7. Gross sales from beef cow herds as percent of total farm sales***

| Percent of gross sales | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| 0-25 | **52** | 43 | 21 | 77 | 69 | 60 | 43 |
| 26-50 | **22** | 25 | 15 | 16 | 21 | 24 | 23 |
| 51-75 | **7** | 10 | 7 | 4 | 5 | 5 | 9 |
| 76-100 | **19** | 22 | 57 | 3 | 5 | 11 | 25 |

*numbers rounded

ranch has in total family income. Beef cows make for a suitable enterprise for part-time farm operations. The "back to the land" movement of recent years has attracted many families with major off-farm employment to start a beef cow enterprise for supplemental income. The proportion of family income derived from the farm reported in this survey showed some wide variability by area of the state. Table 8 illustrates the percentage of total family income that the farm or ranch provides.

**Table 8. Percent of family income derived from farm or ranch***

| Percent of income | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| | | | | % | | | |
| Under 25 | **34** | 33 | 66 | 18 | 20 | 29 | 49 |
| 26-50 | **16** | 16 | 17 | 13 | 15 | 17 | 22 |
| 51-75 | **12** | 12 | 7 | 9 | 17 | 13 | 11 |
| 76-100 | **38** | 39 | 10 | 60 | 48 | 41 | 18 |

*numbers rounded

Contrasting northeast Minnesota with southwest Minnesota illustrates the situation regarding off-farm employment in northeast, versus other on-farm enterprises such as cash crops and hogs in southwest Minnesota. Sixty percent of respondents in southwest Minnesota receive over three-fourths of their income from the farm or ranch. In northeast Minnesota only 10 percent receive this amount of family income from farming or ranching.

## Trends In Beef Cow-Calf Production in Minnesota

In addition to the statistics shown in table 4 on cow numbers, some information relative to producers' intentions was collected.

Respondents were asked the number of years they had owned a beef cow herd. Results are shown in table 9.

**Table 9. Years with a beef cow herd**

| Years | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| | | | | % | | | |
| 1-5 | **23** | 22 | 29 | 16 | 28 | 24 | 24 |
| 6-10 | **26** | 24 | 28 | 25 | 28 | 23 | 36 |
| 11-20 | **33** | 37 | 35 | 36 | 23 | 39 | 30 |
| 21+ | **18** | 17 | 8 | 23 | 21 | 14 | 10 |

About one-fourth of the state's herd owners have been in the cow-calf business less than 5 years. More people are "newer" in the business in northeast Minnesota than any other area. There is greater tendency to longer-term beef cow experiences in southwest and south central Minnesota. The design of Extension education programs should take into account the general level of experience of the herd owners.

When beef producers were asked their future plans regarding the beef enterprise, approximately 25 percent said they planned to sell their cow herd, another 15 percent planned to reduce numbers, 43 percent would remain the same, and 15 percent would expand their herds during the next five years. These data reflect the reduction phase of the beef cycle and attitudes will probably change with improved economic conditions in the beef industry.

Table 10 indicates the status of planning for the next five years, statewide and by survey area. Keep in mind this response was given by producers about January 1, 1977.

**Table 10. Plans for expanding or reducing cow numbers in the next 5 years**

| Status | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| | | | | % | | | |
| Sell out | **26** | 29 | 25 | 19 | 26 | 29 | 21 |
| Reduce | **15** | 18 | 18 | 14 | 16 | 11 | 24 |
| Stay the Same | **44** | 37 | 38 | 55 | 47 | 47 | 40 |
| Expand | **15** | 16 | 19 | 12 | 11 | 13 | 15 |

The relatively high numbers planning to sell out or reduce numbers is in line with national trends of cow numbers for 1976-77. It reflects that point in the cattle cycle where calf producers with unfavorable returns for 2-3 years move to reduce their expected losses.

Farm and ranch operators often say they would like to expand their cow-calf operation, but one or more factors place limitations on this choice. Frequently mentioned limitations are credit, labor, land, and equipment. When asked about these factors, survey respondents indicated that land and labor, in that order, are the most limiting constraints to expansion. Table 11 indicates the statewide and area data relative to limitations on enterprise expansion.

**Table 11. Beef cow-calf enterprise expansion limitations**

| Lack of: | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| Credit | **7** | 9 | 9 | 9 | 8 | 4 | 7 |
| Labor | **31** | 36 | 33 | 23 | 32 | 29 | 27 |
| Land | **52** | 45 | 47 | 60 | 47 | 58 | 54 |
| Equipment | **10** | 10 | 11 | 8 | 13 | 9 | 12 |

Approximately one-half the producers indicated that land was the most important factor limiting expansion these respondents may be assessing: 1) absolute availability of additional land for their unit, 2) high land prices in relation to beef returns, and/or 3) more attractive alternatives for the use of their existing land.

While credit availability is a frequent topic of conversation in agriculture, it did not appear to be a factor of significance among survey respondents, since less than ten percent of respondents listed credit as a limitation.

# LEVELS OF PRODUCTIVITY

Farmers and ranchers maintain a beef cow-calf enterprise in anticipation of optimum production and profits. Some common measures of productivity are: weaning weights, time of calving, age of animals when sold, and percentage of the cow herd that calve annually.

## Time of Calving

Early season calving, though requiring more labor, feed, and management, results in heavier calves at weaning time. The Minnesota calving picture is shown in table 12.

**Table 12. Month(s) of peak calving period***

| Month | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State-wide | NW | NE | SW | SC | SE | Central |
| | | | | % | | | |
| Jan. | **1** | 2 | 1 | 1 | 1 | 2 | 1 |
| Feb. | **4** | 5 | 6 | 4 | 3 | 2 | 3 |
| March | **14** | 22 | 23 | 8 | 12 | 10 | 8 |
| April | **39** | 42 | 43 | 38 | 37 | 37 | 38 |
| May | **28** | 20 | 17 | 35 | 30 | 31 | 28 |
| June | **8** | 4 | 5 | 9 | 9 | 11 | 10 |
| July-Sept. | **3** | 2 | 3 | 4 | 5 | 2 | 6 |
| Oct.-Dec. | **3** | 3 | 2 | 1 | 3 | 5 | 6 |

*figures rounded

## Weaning Weights

A goal of producers is to obtain maximum weight on calves during the period of nursing. The most typical weaning weight reported was between 350 and 450 pounds. There does not appear to be a wide difference in weaning weights in the various areas of Minnesota as shown in table 13.

**Weighing calves for performance testing.**

**Table 13. Calf weaning weights**

| Weaning weight | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| pounds | % | % | % | % | % | % | % |
| 1-300 | **12** | 10 | 13 | 8 | 17 | 14 | 25 |
| 301-350 | **10** | 10 | 12 | 11 | 12 | 8 | 10 |
| 351-400 | **31** | 31 | 34 | 35 | 37 | 24 | 31 |
| 401-450 | **22** | 24 | 20 | 21 | 15 | 24 | 14 |
| 451-500 | **17** | 18 | 15 | 19 | 13 | 19 | 13 |
| 500+ | 8 | 7 | 6 | 6 | 6 | 11 | 7 |

## Percent Calf Crop

Since reliable data were not collected in this survey, an accurate picture of the percentage calf crop obtained on farms and ranches is not available. However, when calves weaned in 1976 are compared to cows on hand January 1, 1976, some indication is obtained. For that comparison 84.7 percent of all herds in Minnesota had a calf crop of 90 percent or more. This means that the percentage calf crop in Minnesota is near 90 percent when calculated as a percent of cows on hand January 1. Variations between regions are not significant when considering this same estimate.

## Age of Feeder Cattle When Marketed

Because the value of the animal sold is directly related to its weight, producers are seeking maximum weight for age. Seasonal price patterns as well as the production plan of the operation may influence the age at which animals are sold. Table 14 gives age in months at which producers in various regions marketed their calves.

**Table 14. Age of feeder cattle when marketed**

| Sales age months | Respondents (percent) by region | | | | | | |
|---|---|---|---|---|---|---|---|
| | State | NW | NE | SW | SC | SE | Central |
| | | | | % | | | |
| 1-5 | **2** | 2 | 1 | – | 1 | 3 | 4 |
| 6-10 | **54** | 61 | 63 | 42 | 28 | 55 | 41 |
| 11-15 | **24** | 25 | 13 | 28 | 30 | 24 | 24 |
| 16-20 | **18** | 11 | 18 | 28 | 34 | 16 | 26 |
| 20+ | **2** | 1 | 5 | 1 | 7 | 2 | 5 |

The most common age for marketing beef feeder cattle in Minnesota is shown to be from 6 to 10 months. These likely represent most of the calves sold while the sales at 16 to 20 months represent cattle held over by herd owners to be sold as yearlings or as feeder cattle. Note that a higher proportion of feeders are retained and fed out by producers in the south central (SC) and southwest (SW) regions when feed grain supplies are more plentiful.

# BEEF COW-CALF MANAGEMENT PRACTICES

## Facilities and Buildings

Buildings and equipment bear a direct relation to some factors of success in the cow-calf enterprise. They influence costs, labor requirements and ease of operation.

Selected handling facilities have proven effective in Minnesota. Frequency of reporting these facilities by farmers and ranchers is illustrated in table 15.

**Table 15. Percentage of herds reporting specific herding facilities (by region)**

| Handling facility | State % | NW % | NE % | SW % | SC % | SE % | Central % |
|---|---|---|---|---|---|---|---|
| Loading chute | **35** | 28 | 29 | 42 | 29 | 47 | 22 |
| Holding-sorting pen | **53** | 58 | 48 | 59 | 48 | 47 | 53 |
| Headgate | **26** | 24 | 20 | 37 | 27 | 27 | 20 |
| Squeeze chute | **13** | 15 | 12 | 12 | 10 | 11 | 14 |
| Scale | **5** | 5 | 3 | 4 | 6 | 5 | 2 |

Table 15 indicates that handling facilities are decidedly lacking for beef herds in Minnesota.

Other than holding pens, relatively low percentages of handling facilities are to be found in Minnesota beef enterprises. Lack of some of these simply results in more labor and less convenience but lack of others such as squeeze chutes and head gates may prevent or impair effective management and health treatments.

Buildings and shelters for cows and calves are reported in table 16.

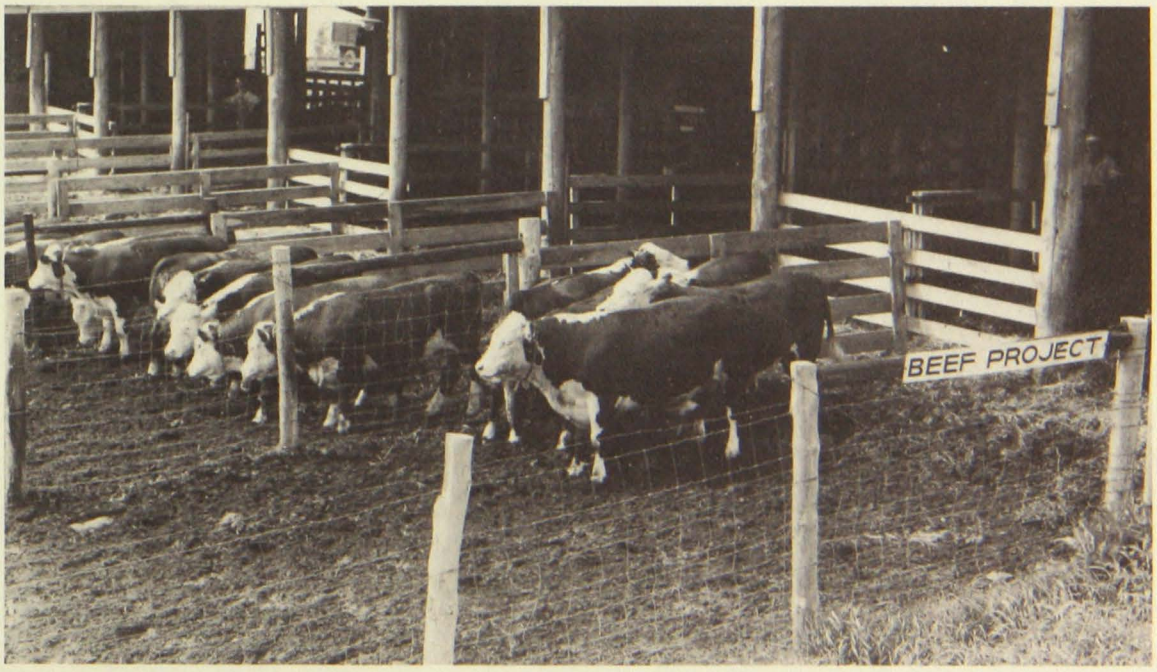
**Table 16. Percent of herds reporting type of buildings and shelter (by region)**

| Building or shelter | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| | | | | ½ | | | |
| Building access in winter | **79** | 81 | 82 | 74 | 90 | 73 | 86 |
| Calf shelter | | | | | | | |
| Pole barn | **35** | 38 | 31 | 37 | 34 | 31 | 49 |
| Old dairy barn | **39** | 42 | 50 | 31 | 47 | 32 | 31 |
| Natural shelter | **26** | 20 | 18 | 33 | 19 | 36 | 20 |
| Portable shelter | **24** | 24 | 25 | 22 | 26 | 22 | 31 |

Over 75 percent of the Minnesota beef units provided building access for wintering cows. Portable calf shelters were reported on approximately 25 percent of the farms and ranches.

## Performance Testing

Herd owners choose among several alternative management methods in herd selection and improvement and practices such as growth implants, dehorning, and castration. Each of these practices has some impact on short term or long run productivity in the enterprise. Analysis of response data indicates that frequently an association exists between use of a given management practice and size of the herds involved. This relationship may have some bearing on the kind of Extension educational program to be designed.




**Adequate facilities are important in the beef enterprise.**

Performance testing, i.e., the use of sires of known genetic capability and the selection of replacement stock on the basis of cow-calf performance is gaining in popularity. However, as shown in tables 17 and 18 Minnesota herd owners do not widely use performance testing in their operations.

**Table 17. Percentage of herds using a performance-tested bull (by region and by herd size)**

| Herd size in cows | State-wide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| | | | % | | | | |
| Less than 20 | **31** | 24 | 20 | 29 | 28 | 44 | 34 |
| 21-100 | **30** | 24 | 19 | 36 | 34 | 30 | 37 |
| 101+ | **53** | 33 | – | 39 | 50 | 86 | 33 |

About one half the herds over 100 in size statewide used performance-tested bulls in their breeding program. Smaller herds were less likely to use this recommended production management practice.

**Table 18. Percentage of herds doing performance testing cows-calves (by region and by herd size)**

| Herd size cows | State-wide % | NW % | NE % | SW % | SC % | SE % | Central % |
|---|---|---|---|---|---|---|---|
| Less than 20 | **3** | 1 | 4 | 4 | 6 | 3 | 4 |
| 21-100 | **6** | 8 | 5 | 7 | 6 | 4 | 5 |
| 100+ | **21** | 37 | – | 6 | – | 29 | – |

Performance testing (calf weighing, evaluation and selection), though a proven aid to herd productivity improvement, has not been well accepted by Minnesota herd owners. Larger herds in northwest and southeast Minnesota show more respondents using performance testing, however.

## Crossbreeding

Crossbreeding has shown advantages in production in beef herds. Incorporating desirable features of particular breeds plus the potential for heavier calf weaning weights has been attractive to many beef producers. Table 19 gives a picture of crossbreeding by size of herd and location in Minnesota. Again the larger herds more commonly practice crossbreeding.

**Table 19. Percentage of herds using crossbreeding (by region and by herd size)**

| Herd size cows | State-wide % | NW % | NE % | SW % | SC % | SE % | Central % |
|---|---|---|---|---|---|---|---|
| Less than 20 | **57** | 58 | 51 | 64 | 57 | 55 | 53 |
| 21-100+ | **66** | 66 | 59 | 79 | 53 | 59 | 61 |
| 100+ | **88** | 84 | 100 | 94 | 51 | 86 | 100 |

## Growth Implants

Based on favorable research results, animal science specialists recommend the use of growth implants as a management practice to improve calf weights. As shown in table 20, this practice has been slow to be adopted in Minnesota. Respondents with herds above 100 cows more frequently used implants.

**Table 20. Percentage of herds using growth implants (by region and by herd size)**

| Herd size cows | State-wide % | NW % | NE % | SW % | SC % | SE % | Central % |
|---|---|---|---|---|---|---|---|
| Less than 20 | **2.0** | 0 | .6 | 4.5 | 4.6 | 1.7 | 1.9 |
| 21-100 | **6.5** | 3.8 | 0 | 11.7 | 2.9 | 6.5 | 5.6 |
| 100+ | **25** | 14.7 | 0 | 37 | 25.2 | 22.9 | 0 |

## Pregnancy Testing

The largest cost item in producing a feeder calf is the year's feed for the cow. A cow must produce a calf yearly to justify keeping her in the herd. Cows not conceiving are a problem to producers in this regard. A recommended practice by Extension veterinarians is that of pregnancy testing to determine the potential for producing a calf. This practice, though used in one-half the state's herds over 100 cows, is not generally reported by respondents to this survey. Small (less than 20 cow) herds show a very low percentage using pregnancy checks as shown in table 21.

**Table 21. Percentage of herds using pregnancy testing (by region and by size of herd)**

| Herd size cows | State-wide % | NW % | NE % | SW % | SC % | SE % | Central % |
|---|---|---|---|---|---|---|---|
| Less than 20 | **8** | 8 | 4 | 12 | 5 | 9 | 16 |
| 20-100 | **23** | 14 | 21 | 28 | 15 | 25 | 29 |
| 100+ | **51** | 42 | 100 | 33 | 50 | 74 | 0 |

## Managing Pests

Internal and external parasites and insects are known to influence productivity in cow-calf operations. Producers were asked if they treated their cattle for control of lice, grubs, worms, and flies. Statewide, 80 percent of respondents treated for lice, 72 percent for fly control, 43 percent for grubs, and 35 percent for worms. Somewhat less treatment was reported in the northern areas of the state than other regions. For example, 25 percent of northern Minnesota respondents treated for worms while 54 percent of those in the southwest reported treating for this parasite.

## Castrating and Dehorning

Castrating male calves and dehorning are practices recommended in cow-calf operations. Tables 22 and 23 illustrate the extent of these two management practices among respondents in the survey. Because timing or age of animals is a factor in the use of these practices, the data are reported by age of animals as well as size of herd.

On smaller herds the tendency is to castrate at younger ages, while operators of larger herds castrate at weaning time. Up to 20 percent of the small herd owners do not castrate their male animals.

According to this survey, a high percentage of beef cattle in Minnesota do not have horns. Polled cattle account for nearly half of the nonhorned cattle. Weaning time is the most common period for dehorning, and it is more frequent in herds of over 100 cows.

**Table 22. Percentage of herds castrating male calves at various ages (by region and by size of herd)**

| Castration period | Statewide % | | NW % | | NE % | | SW % | | SC % | | SE % | | Central % | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Herd size >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 |
| 0-2 mo. | **33** | **21** | 47 | 23 | 51 | – | 22 | 33 | 18 | 75 | 27 | – | 25 | 33 |
| 2-4 mo. | **21** | **21** | 21 | 19 | 13 | – | 18 | 12 | 29 | – | 25 | 39 | 23 | – |
| Weaning | **29** | **54** | 22 | 50 | 18 | 100 | 40 | 51 | 42 | 25 | 27 | 61 | 34 | 67 |
| Not castrated | **17** | **3** | 11 | 9 | 18 | – | 20 | 3 | 10 | – | 20 | – | 19 | – |

**Table 23. Percentage of herds using dehorning at various ages (by region and size of herd)**

| Dehorning period | Statewide % | | NW % | | NE % | | SW % | | SC % | | SE % | | Central % | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Herd size >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 | >20 | <100 |
| 0-2 mo. | **9** | **11** | 13 | 26 | 14 | – | 1 | 15 | 4 | | 11 | – | 8 | – |
| 2-4 mo. | **10** | **8** | 21 | 15 | 4 | – | 6 | – | 19 | | 13 | 25 | 15 | – |
| Weaning | **19** | **46** | 14 | 27 | 9 | 100 | 34 | 51 | 18 | 20 | – | 25 | 67 | – |
| Not dehorned | **13** | **6** | 16 | 9 | 14 | – | 18 | 12 | 7 | 11 | – | 10 | – | – |
| Polled cattle | **48** | **28** | 47 | 23 | 59 | – | 40 | 21 | 53 | | 46 | 75 | 42 | 33 |

> Signifies "less than"
< Signifies "more than"

# *MARKETING BEEF CATTLE IN MINNESOTA*

Beef producers often express dissatisfaction with the cattle marketing phase of their business. They may be referring to the price they receive or to something in the total marketing chain over which they have little control. Producers were asked several questions regarding marketing. Their responses are reported in the following tables.

## How and Where Cattle are Marketed

Table 24 indicates where feeder cattle go for first marketing. Feeder cattle are most commonly put into the producer's own feedlot or sold at terminal markets. As would be expected, the pattern of marketing varies from region to region depending on location of terminals, number of marketing outlets in the areas, and type of feeder cattle producers. The producer sale, while used to some extent in northeast and central Minnesota, does not account for a large percentage of the feeder cattle sales in Minnesota.

**Table 24. Feeder cattle marketing methods, percent by region***

| Location | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Feedlot buyer | **13** | 17 | 14 | 11 | 10 | 11 | 9 |
| Producer sale | **2** | 2 | 5 | 5 | 2 | 1 | 1 |
| Local dealer | **11** | 15 | 19 | 4 | 5 | 10 | 10 |
| Local sales barn | **19** | 8 | 14 | 19 | 8 | 34 | 23 |
| Terminal market | **29** | 49 | 31 | 21 | 23 | 14 | 20 |
| Owners feedlot | **28** | 13 | 20 | 50 | 48 | 27 | 38 |
| Other | **4** | 2 | 8 | 3 | 4 | 4 | 3 |

*Note some respondents market cattle at more than one point, thus totals exceed 100 percent.

## Basis of Sales

Table 25 lists the basis of sales of feeder cattle. Most feeder cattle are marketed on a per pound basis. Variations which exist among areas are likely influenced by the method used to sell feeder cattle.

**Table 25. Basis of sales of feeder cattle, percent by region**

| Basis | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Per head | **18** | 25 | 27 | 16 | 8 | 3 | 15 |
| Per pound | **82** | 75 | 73 | 84 | 92 | 97 | 85 |

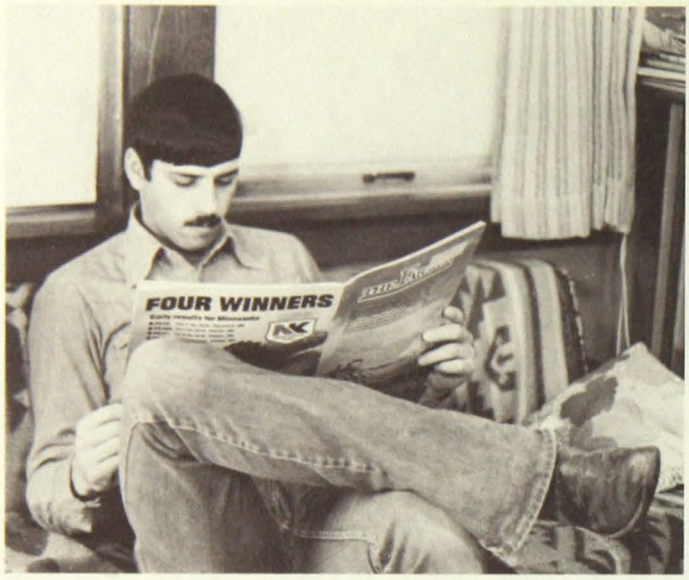
Selling cattle by the head is more common in northern Minnesota while the per pound basis rates are very high in southern Minnesota.

## Source of Price Information

There is a wide range of sources of information on cattle marketing. Table 26 summarizes where producers receive price information.

**Table 26. Where producers receive price information sources, percent by region**

| Source | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Outlook | **6** | 8 | 4 | 7 | 5 | 6 | 3 |
| Magazines | **23** | 26 | 27 | 24 | 16 | 20 | 28 |
| Minn. Beef News | **2** | 3 | 4 | – | – | 1 | 1 |
| Private market news | **6** | 7 | 5 | 6 | 8 | 4 | 3 |
| Radio | **48** | 55 | 46 | 43 | 39 | 44 | 59 |
| Other cattlemen | **24** | 25 | 35 | 20 | 11 | 28 | 20 |
| Commission companies | **18** | 22 | 12 | 28 | 10 | 14 | 14 |




**Producers obtain marketing information from a variety of sources.**

Radio, other cattlemen, and magazines appear to be the major first hand sources of price information for Minnesota beef producers.

## Perceived Marketing Problems

In an effort to identify what farmers and ranchers feel are their marketing problems, a set of questions was presented. Respondents listed the two top problems, and the total frequency tabulation is shown in percentages in table 27.

About two-thirds of the respondents perceive that they have a marketing problem of some, but varying type. Problems most commonly and consistently identified are lack of information to help decide when to sell and lack of information on their type of cattle. These problems were identified more often in some regions than in others. Where local facilities do not exist, lack of them is noted more often by respondents. Lack of enough buyers is generally identified as a problem more often in the same region. These two are tied quite closely together.

**Table 27. Beef producers perceived marketing problems, respondents (percent) by region**

| Problems | Statewide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Lack of information on my type cattle | **19** | 22 | 23 | 16 | 17 | 15 | 23 |
| No information to help decide where to sell | **24** | 23 | 27 | 26 | 16 | 25 | 24 |
| Marketing costs are too high | **19** | 19 | 15 | 19 | 17 | 19 | 21 |
| Inability to grade & evaluate accurately | **11** | 12 | 12 | 11 | 9 | 11 | 13 |
| Not enough buyers in the area | **16** | 19 | 21 | 12 | 14 | 13 | 10 |
| Lack of local market facilities | **10** | 14 | 17 | 9 | 9 | 4 | 5 |
| No problem | **30** | 27 | 22 | 29 | 34 | 36 | 31 |

## Attitudes on Marketing Ideas

Several selected marketing ideas were suggested to those who were surveyed. The ideas proposed are thought, by Extension specialists, to be of some assistance with beef cattle marketing problems. Respondents indicated whether they thought each idea was favorable or unfavorable. Results are shown in table 28. Only the percentage checking favorable or unfavorable in each region are given. The remainder were either undecided or did not respond to the questions.

Respondents are divided in their thinking regarding ideas to aid in marketing.

Holding local feeder cattle sales in an auction building was favored both statewide and in most regions. A high percentage of producers in the northwest region seemed to favor holding a special sale at the Fargo or South St. Paul market. Pooling cattle and contracting to commit a certain number to an organized local or terminal sale were generally unfavorable to respondents.

**Table 28. Producers attitude toward selected marketing ideas, (percent by region)**

| Marketing | Statewide | | NW | | NE | | SW | | SC | | SE | | Central | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| idea | Fav | Unf | Fav | Unf | Fav | Unf | Fav | Unf | Fav | Unf | Fav | Unf | Fav | Unf |
| | | | | | | % | | | | | | | | |
| Build local feeder cattle sales facility | **36** | **31** | 37 | 27 | 47 | 23 | 32 | 29 | 23 | 35 | 34 | 41 | 34 | 25 |
| Hold local sales in auction building | **50** | **22** | 41 | 26 | 65 | 10 | 48 | 27 | 44 | 20 | 52 | 23 | 60 | 15 |
| Pool cattle by grade with other producers | **22** | **45** | 23 | 42 | 21 | 37 | 18 | 52 | 28 | 38 | 21 | 54 | 23 | 34 |
| Hold "Northern Minn." sale at Fargo or S. St. Paul | **31** | **35** | 46 | 22 | 31 | 31 | 17 | 48 | 28 | 38 | 18 | 49 | 39 | 22 |
| Contract to organized sale-local/terminal | **14** | **48** | 16 | 42 | 13 | 43 | 15 | 36 | 14 | 49 | 10 | 64 | 23 | 45 |
| Contract to commission firm or organization | **30** | **36** | 32 | 29 | 24 | 43 | 32 | 35 | 32 | 35 | 28 | 41 | 28 | 30 |

# FORAGE CROP PRODUCTION AND HANDLING

## Harvested Forage Acreage and Use

Forage crops provide the major feed ingredient for the beef cow-calf enterprise in Minnesota. Harvested forages are required for 7 months with pasture providing the remaining 5 months of feed requirements.

Minnesota farmers have approximately 30 million acres in cropland. Survey results show beef cow-calf operators with a variation in the acreage used for crop production, table 29. Acres devoted to cropland is extensive in the northwest, southwest, south central, and southeast with northeast and central Minnesota operations least. Because the beef cow-calf enterprise does not provide all the total farm income, cropland acreage is often larger than required for the cow-calf herd.

**Table 29. Cropland acres used (percentage of respondents by various acreage units)**

| | % | | | | | | |
|---|---|---|---|---|---|---|---|
| Acres | State | NW | NE | SW | SC | SE | Central |
| 1-20 | **15** | 13 | 28 | 3 | 12 | 16 | 22 |
| 21-40 | **20** | 18 | 40 | 7 | 15 | 21 | 30 |
| 41-100 | **37** | 32 | 28 | 37 | 40 | 44 | 40 |
| 101-200 | **18** | 21 | 4 | 34 | 24 | 13 | 6 |
| 201 & above | **10** | 15 | 1 | 5 | 9 | 6 | 1 |

Survey respondents harvest various types of forage from their cropland acreage, table 30. Hay, corn silage, and corn stover were the harvested forages most commonly used by beef producers. Corn silage use was highest in southwest Minnesota and least in northeast. Haylage figures are expected to reflect only those operations in which dairy or cattle feeding operations share the income with the cow-calf operation.

**Table 30. Percentage of survey respondents that harvested various forages in 1975**

| Forages | State-wide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Hay | **74** | 80 | 85 | 77 | 66 | 64 | 69 |
| Haylage | **6** | 4 | 2 | 4 | 5 | 10 | 4 |
| Corn silage | **38** | 32 | 13 | 64 | 47 | 39 | 42 |
| Corn stover | **20** | 6 | 2 | 31 | 39 | 31 | 16 |
| Small grown hay | **4** | 5 | 5 | 6 | 1 | 2 | 1 |
| Other | **4** | 6 | 2 | 4 | 5 | 4 | 1 |

Although few producers used the haylage system of harvesting forage, those that used the system harvest large tonnages. Statewide, 46 percent harvest over 150 tons per year as shown in table 30. Corn silage tonnages also are large because approximately one-third of the producers harvested over 200 tons annually. Corn stover was harvested in small quantities, 52 and 22 percent of respondents harvested 0-30 and 31 to 70 tons per year, respectively. A summary is shown in table 31.

**Table 31. Tonnage of various forages harvested in 1975 by respondents, statewide, (percentages)**

| Tons of forage | Hay | Haylage[1] | Corn silage | Corn[2] stover |
|---|---|---|---|---|
| 0-50 | 36 | 16 | 39 | 52 |
| 51-100 | 28 | 31 | | 22 |
| 101-200 | 23 | 7 | 29 | 26 |
| 201 & up | 14 | 46 | 32 | – |

[1] Tonnage categories: 0-50, 51-100, 101-150 and over 151 tons
[2] Tonnage categories: 0-30, 31-70 and over 71 tons

Annually, Minnesota farmers harvest hay on 3.75 million acres. Hay production in 1975 by beef producers is listed by regions in table 32.

**Table 32. Hay harvested in 1975 by survey respondents (listed as a percentage of respondents)**

| Tons | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 0-50 | **36** | 29 | 23 | 50 | 49 | 36 | 39 |
| 51-100 | **28** | 26 | 30 | 30 | 33 | 20 | 32 |
| 101-250 | **27** | 29 | 29 | 17 | 18 | 35 | 14 |
| 251-525 | **8** | 14 | 6 | 3 | 2 | 5 | 11 |
| 525 & up | **2** | 2 | 1 | 0 | 0 | 3 | 3 |

If hay is the only forage in the forage portion of the ration, a beef cow requires approximately 2.5 tons of hay per year. Using this assumption, the tonnage categories in table 32 represent the herd sizes listed in table 5. For example, 20 cows require 52 tons thus category 1-20 cows equal 0-50 tons in table 31. Note that in 1977, 70 and 84 percent of southwest and south central producers, respectively, reported herd sizes of less than 40. Similarly, 80 and 82 percent of producers in southwest and south central, respectively, produced enough hay to feed these cows, but in northwest, northeast, and southeast, one must look at the next largest size (101-250) to obtain at least 80 percent of respondents. Therefore, in relation to beef cow herd size, producers in northwest, northeast, and southeast produce more hay than those in southwest and south central.

## Hay Harvesting Methods

Hay harvesting methods have changed in recent years with introductions of the large round balers and mechanical stackers. The survey gives an indication of the relative use of four common harvesting methods in Minnesota. Data in table 33 indicate the rectangular baler still predominates in Minnesota. The numbers exceed 100 percent which indicates some producers use two methods. The rectangular baler remains as the method used most frequently because the herd size is small.

**Though large round bales are being used more frequently, the rectangular bale is still the most prominent in Minnesota.**

**Table 33. Percentage of producers surveyed using various hay harvesting methods**

| Method | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Rect. bale | **81** | 73 | 86 | 80 | 80 | 86 | 88 |
| Large rd. bale | **14** | 23 | 12 | 5 | 8 | 14 | 6 |
| Mech. stack | **8** | 6 | 2 | 15 | 17 | 7 | 2 |
| Stack loose | **5** | 11 | 2 | 3 | 4 | 1 | 4 |

**Table 34. Unimproved permanent pasture acreage (percentage respondents by acreage units of one cow)**

| Acres | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1-20 | **30** | 24 | 22 | 22 | 47 | 40 | 32 |
| 21-40 | **22** | 22 | 25 | 17 | 27 | 20 | 34 |
| 41-100 | **33** | 32 | 39 | 46 | 20 | 30 | 30 |
| 101-200 | **11** | 13 | 12 | 13 | 6 | 8 | 3 |
| 201 & above | **4** | 8 | 2 | 2 | 0 | 1 | 0 |

## Pasture Acreage

Minnesota farmers-ranchers use approximately 4.5 million acres for pasture. Pasture acreage includes cropland pasture (periodically seeded — referred to as improved pasture in this survey), permanent pasture (unimproved in the survey), and woodland used for pasture. Statewide, over 2.4 million acres are cropland pasture with the remaining acreage evenly divided between permanent and woodland pastures.

Average carrying capacity of pastureland for beef cow-calf operators in Minnesota is 3 acres per cow. Assuming an equal amount of improved, unimproved, and woodland pasture on most cow-calf enterprises, each of the following pasture acreage table (tables 34, 35, and 36) has been categorized by herd size categories listed in table 5. Hence, 1-20 cows coincides with 1-20 acres of improved, unimproved, and woodland pasture.

Unimproved permanent pastures, in contrast to some western range states, are found in relatively small acreage in Minnesota, table 34. Pasture size varies most in northern Minnesota and least in south central which has almost half their permanent pastures in 1-20 acre sizes.

Woodland pastures consist partly of forage and partly of trees and shrubs. Many woodland pastures have resulted from removal of forest products and subsequent growth of grasses. Many of these pastures could provide more carrying capacity following land clearing and introduction of improved perennial grasses and legumes. Other acreage is perhaps best suited to forest land.

Again, acreages vary between regions of the state, table 35. Fifty-three percent of woodland pasture acreage statewide is 40 acres or less. However, woodland pastures in northern Minnesota are larger (approximately 20 percent of pastures are over 100 acres in northwest and northeast) than in southern Minnesota (10 percent over 100 acres in southwest and south central).

The most variation in woodland pasture size occurs in northwest, northeast, and southeast Minnesota.

Research and demonstrations have shown unproductive permanent pastures in Minnesota can increase in beef productivity three-fold by seeding and managing

**Table 35. Woodland pasture acreage (percentage of respondents by acreage units of one cow)**

| Acres | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1-20 | **32** | 26 | 27 | 43 | 46 | 38 | 31 |
| 21-40 | **21** | 23 | 21 | 25 | 20 | 16 | 24 |
| 41-100 | **30** | 30 | 33 | 21 | 26 | 29 | 34 |
| 101-200 | **13** | 14 | 15 | 7 | 7 | 14 | 7 |
| 201 & above | **5** | 8 | 4 | 4 | 1 | 4 | 4 |

improved species of legumes and grasses. More acreage of improved pasture is in smaller parcels in northeast, south central, southeast, and central Minnesota as shown in table 36. With the exception of southeast Minnesota, these regions also represent the smallest total cow numbers, table 4. In contrast, the largest herd concentrations, northwest and southwest, have the most variation in acreage of unimproved pasture.

**Table 36. Improved pasture (seeded and fertilized) acreage (percentage respondents by acreage units of one cow)**

| Acres | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1-20 | **34** | 20 | 40 | 33 | 61 | 40 | 47 |
| 21-40 | **27** | 34 | 25 | 24 | 30 | 22 | 17 |
| 41-100 | **24** | 29 | 26 | 25 | 5 | 27 | 25 |
| 101-200 | **8** | 13 | 6 | 13 | 0 | 8 | 8 |
| 201 & above | **4** | 5 | 2 | 4 | 4 | 3 | 3 |

### Forage Species

Species of forages reported used on both pasture and harvested forage include most of the common grasses and legumes. Several species may be grown on a single farm or ranch. Alfalfa and alfalfa grass mixtures are the most commonly reported forages. Statewide, pure alfalfa was grown by 44 percent of respondents and on alfalfa grass mixtures by 59 percent. Northeast Minnesota showed a relatively high percentage of respondents with clover-grass forage (70 percent). That area also had less alfalfa (25 percent) compared to the southwest area, for example, with 60 percent reporting alfalfa acreage. Among legumes grown by farms and ranches in this survey, alfalfa was most commonly reported with birdsfoot trefoil showing from 0 percent in the central area to only 5 percent in northeast Minnesota. Among grasses, timothy and bromegrass were quite commonly grown. Statewide, 33 percent of respondents indicates some timothy, 28 percent some brome. Reed canary grass and orchard grass were next in significance with 23 percent and 16 percent reporting, respectively. Corn stalks were used as a forage crop in all areas. Statewide, 38 percent of the farms were using this product for beef cattle feed. The percentage of respondents reporting use of cornstalks varied from a high of 61 percent in southwest to a low of 11 percent northeast.

# *FORAGE CROP MANAGEMENT PRACTICES*

The set of management practices used by farmers and ranchers in forage production, handling, and storage are extremely important in the value of forage produced and the ultimate feeding results.

Many factors affect the practices used, for example, type of soil, availability of equipment (capital for buildings and equipment), labor supply, and knowledge and skills of the operator.

### Seeding Equipment

The seeding method used often influences the forage stand obtained and the resulting yields. Survey respondents throughout Minnesota were using the methods shown in table 37.

**Table 37. Percentage of producers surveyed using various seeding equipment to establish forages***

| Equipment | State-wide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Grain drill | **35** | 28 | 30 | 36 | 41 | 44 | 23 |
| Press wheel drill | **4** | 7 | 1 | 7 | 1 | – | 3 |
| Cultipacker | **3** | 2 | 3 | 1 | 1 | 6 | 9 |
| Grain drill with grass attachment | **44** | 46 | 44 | 42 | 47 | 41 | 46 |
| Broadcast | **22** | 27 | 37 | 20 | 17 | 14 | 13 |

*Some respondents use more than one method.

**The grain drill or a grain drill with improved attachments is the predominant method of seeding forages in Minnesota.**

The grain drill or grain drill with grass seeding attachment accounts for the large majority of seeding methods. The cultipacker, a machine recommended for improved seedbed and reduced seed requirements, shows very low use in Minnesota.

## Plant Food - Manure and Fertilizers

To maintain and improve production of forages, sufficient plant food is required. As most forage producers are also livestock producers, they have manure available for supplying part of the plant food needs. Commercial fertilizer is another option available for meeting plant food requirements.

Producers surveyed indicated on which crop manure was used. This is shown in table 38. Available manure is more commonly used on grain cropland in Minnesota.

**Table 38. Percentage of producers surveyed using manure on various crops, by regions of Minnesota.**

| Use of manure | State-wide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Yes | **86** | 83 | 87 | 87 | 84 | 87 | 88 |
| On grain crops | **67** | 61 | 40 | 80 | 80 | 72 | 84 |
| On hayland | **43** | 46 | 70 | 27 | 26 | 41 | 34 |
| On pasture | **21** | 21 | 18 | 17 | 19 | 25 | 18 |

Commercial fertilizer is purchased for use on various crops in Minnesota. Table 39 indicates the percentage of farms using purchased fertilizer in hayland and pastureland.

The data in table 39 illustrate the general observation that fertilizer is not used extensively on pasture lands in Minnesota, and particularly not in northeast Minnesota where response to fertilizer is very good.

**Table 39. Percentage of respondents using fertilizer on hayland and pastureland**

| Forage | State-wide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Hayland | **60** | 59 | 52 | 74 | 67 | 58 | 43 |
| Pasture | **31** | 28 | 14 | 39 | 34 | 39 | 21 |

Weeds are considered a problem in any type of crop production. When asked the question "Do you feel you have a weed problem in hay and pastureland?" only about one-fourth indicated a yes answer. This varied from 18 percent in the southwest area to 29 percent in the southeast. The weed reported causing the most problem was Canada thistle.

Some weeds may be controlled in pastures by use of chemical herbicides. When asked if permanent pastures were treated with chemical weed control, responses were as shown in table 40.

## Chemical Weed Control

**Table 40. Use of chemical weed control in permanent pastures, percentage of respondents by region**

| | State-wide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Percentage using chemical | **22** | 10 | 3 | 49 | 27 | 21 | 11 |

# ALFALFA MANAGEMENT

Alfalfa is the major forage crop in Minnesota. Research and producer experiences indicate that several factors of management greatly influence results obtained with this crop. Years of life of the alfalfa stand, time of first cutting, and number of cuttings are factors at least partially under the control of the operator and that do influence ultimate forage quantity, quality, and/or cost per unit of feed produced. Table 44 shows the length of life of an alfalfa seeding by regions in Minnesota.

## Life of Alfalfa

Three or four years is the most common life of an alfalfa stand in Minnesota. Stands are left for a longer period in northeast and northwest Minnesota.

## Time of Cutting

Time of first cutting of hay may influence both quality and quantity of the forage. Table 42 portrays the Minnesota seasonal harvesting pattern among survey respondents.

Forage agronomists recommend early cutting for a quality forage product. Statewide, about one-third of the respondents begin cutting their hay before June 10th; however, in the southwest over one-half and in south central nearly two-thirds start by that date.

**Table 41. Years alfalfa lasts after seeding, percent of respondents reporting by region**

| Years life | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1 | **1** | 1 | 3 | 1 | 1 | 1 | 3 |
| 2 | **11** | 4 | 10 | 10 | 12 | 19 | 5 |
| 3 | **33** | 19 | 20 | 36 | 43 | 40 | 36 |
| 4 | **26** | 32 | 28 | 27 | 24 | 22 | 20 |
| 5 | **18** | 26 | 24 | 15 | 13 | 12 | 25 |
| 6 | **11** | 19 | 15 | 11 | 7 | 6 | 11 |

**Table 42. Percentage of survey respondents that begin harvesting first crop hay by dates indicated**

| | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| | | | | % | | | |
| May 20-31 | **6** | 3 | 1 | 11 | 10 | 9 | 5 |
| June 1-9 | **34** | 17 | 9 | 52 | 62 | 43 | 47 |
| June 10-19 | **28** | 28 | 16 | 28 | 21 | 32 | 38 |
| June 20-30 | **22** | 39 | 35 | 6 | 4 | 13 | 8 |
| July 1-9 | **9** | 12 | 36 | 2 | 2 | 3 | 2 |
| July 10-20 | **1** | 1 | 3 | 1 | 1 | 0 | 0 |

### Number of Cuttings

Number of cuttings of alfalfa obtained is a function of the soil-climate conditions in the region as well as the management of the alfalfa field. Table 43 indicates cuttings obtained and shows southern Minnesota with higher numbers of annual cuttings.

**Table 43. Number of alfalfa cuttings by region, (percent of respondents)**

| Cuttings | Statewide | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| Graze Regrowth | **6** | 25 | 2 | 3 | 1 | 5 | 0 |
| 1 | **3** | 5 | 10 | 2 | 0 | 1 | 1 |
| 2 | **45** | 75 | 60 | 14 | 6 | 51 | 47 |
| 3 | **46** | 15 | 5 | 81 | 93 | 44 | 52 |

### Time of Harvesting Period

Hay harvesting, for maximum quality forage production, is a timely operation. Each day past optimum cutting time may mean a loss in feed value. Weather, kind of equipment, and availability of labor are factors influencing timeliness in hay harvesting. Minnesota hay producers, according to survey respondents, do take considerable time to complete a haying operation. Table 44 illustrates this by region in Minnesota.

The first cutting, while completed within a week on three-fourths of the farms/ranches in southern Minnesota, takes three weeks or more on over 40 percent of northeast Minnesota units and 27 percent of northwest Minnesota units.

**Table 44. Percentage of beef producers surveyed reporting time required to complete first cutting hay**

| Weeks | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1 | **44** | 28 | 19 | 77 | 77 | 45 | 42 |
| 2 | **34** | 45 | 39 | 19 | 16 | 33 | 41 |
| 3 | **12** | 14 | 20 | 2 | 2 | 14 | 12 |
| 4 | **6** | 7 | 15 | 1 | 2 | 6 | 2 |
| 5 | **4** | 6 | 7 | 1 | 3 | 2 | 3 |

# *PRODUCER-PERCEIVED MANAGEMENT PROBLEMS*

In the survey, producers were asked to indicate their level of concern on a set of common management problems, that is, whether they considered the item high, medium, or low as a problem or concern. Responses were not generally significantly different from one region of the state to another. An exception is land clearing which is of greater concern in the northern Minnesota regions.

Table 45 indicates how respondents rated eleven problems as to their level of concern.

Marketing, forage management, buildings, corrals, and fences were listed as medium or high levels of concern by about two-thirds of respondents. On the other hand, over one-half those responding considered land clearing, pasture rotation, calving problems, and open cows to be a low-level problem or concern.

**Table 45. Percentage of respondents rating selected management problems as high, medium, low in their operation**

| Management Problem | Level of concern | | |
|---|---|---|---|
| | High | Medium | Low |
| Herd health | 23 | 32 | 45 |
| Forage management | 20 | 42 | 38 |
| Marketing feeder cattle | 25 | 38 | 37 |
| Land clearing | 14 | 17 | 69 |
| Pasture rotation | 16 | 30 | 54 |
| Bull & cow selection | 23 | 35 | 42 |
| Calving problems | 11 | 34 | 55 |
| Open cows | 12 | 30 | 58 |
| Calf health & management | 23 | 31 | 46 |
| Farm records | 18 | 40 | 42 |
| Buildings, corrals, fences | 28 | 43 | 29 |

# THE INFLUENCE OF SIZE OF HERD

As shown previously in table 5, herd size varies considerably in Minnesota. University Extension staff have observed that management practices vary by size of herd on the farm or ranch. An implication of this is the type of Extension program or information that needs to be designed to meet the needs of people with various size cow-calf units. A question frequently asked is "Does Extension meet the needs of both the small and the large producer?"

## Herd Size Distribution

Table 46 illustrates a summary of respondent herd size by those under 20 cows, those from 21-100 and those 101 and above. Data are given in percentage of herds by regions of Minnesota.

**Table 46. Size of herd by area in Minnesota, percent of respondents**

| Herd size cows | State | NW | NE | SW | SC | SE | Central |
|---|---|---|---|---|---|---|---|
| 1-20 | **45** | 45 | 63 | 35 | 60 | 41 | 57 |
| 21-100 | **50** | 50 | 36 | 58 | 38 | 54 | 40 |
| 101+ | **5** | 5 | 1 | 7 | 2 | 5 | 3 |

Survey results showed some marked differences in characteristics of the beef enterprise and management practices by herd size and by region of the state. The following tables serve to illustrate these relationships for several important variables.

## Farm-Ranch Income from Beef

Of the total farm income, that provided by the beef enterprise varies considerably by size of herd as shown in table 47. In northeast Minnesota, just over 50 percent of respondents receive over three-fourths of their farm income from herds of 20 cows or less. While in south central Minnesota, 50 percent of those with herds over 100 were reporting this beef income as less than 25 percent of their total farm income.

## Total Income

Considering the total farm income in relation to total family income, differences reported by respondents are shown in table 48. When 75 to 100 percent of family income was from the farm, there were 75 percent of respondents statewide in this category who had over 100 cows. In the northeast area, 75 percent of respondents with less than 20 cows had less than 25 percent of total family income from the farm.

## Fertilizer Use

Table 49 shows how fertilizer was used on hay and pasture land in relation to size of herd, i.e. those under 20 cows and those over 100 cows.

In nearly all areas of the state, respondents with larger herds were more inclined to use fertilizer for both hay and pasture production. Relatively fewer respondents used fertilizer in the northern regions compared to the southern portion of Minnesota.

## Time of Hay Cutting

In another forage management practice, table 50 illustrates time of cutting of hay in relation to herd size.

Statewide there are some differences in early cutting with those producers having larger herds cutting hay at an earlier date.

## Handling Pests

When reporting on handling of pests, respondents with herds over 100 cows most frequently used control measures. Table 51 illustrates four pest situations.

## Rank of Management Practices

When producers were asked to evaluate (high, medium, low) their concern for management problem situations in their herd, differences by size of herd were observed. In nearly all categories, as shown in table 52, those with larger herds indicated a higher level of concern with each problem in their herds than did smaller herd owners.

These data may imply that owners of smaller herds are less aware of, or in fact do not have a major concern for the problems as stated.

**Table 47. Percent of total farm income from beef cow herd in relation to size of herd, respondents by region**

| Percent of income from beef herd | Statewide >20 | Statewide <100 | NW area >20 | NW area <100 | NE area >20 | NE area <100 | SW area >20 | SW area <100 | SC area >20 | SC area <100 | SE area >20 | SE area <100 | Central area >20 | Central area <100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Less than 25 | **59** | **29** | 45 | 19 | 24 | 0 | 90 | 40 | 80 | 50 | 64 | 26 | 61 | 0 |
| 26-50 | **17** | **35** | 25 | 15 | 17 | 57 | 6 | 28 | 11 | 50 | 18 | 52 | 21 | 67 |
| 51-75 | **5** | **17** | 5 | 19 | 8 | 0 | 3 | 19 | 4 | 0 | 2 | 16 | 12 | 33 |
| 76-100 | **19** | **19** | 24 | 47 | 51 | 42 | 0 | 13 | 4 | 0 | 17 | 6 | 6 | 0 |

> Signifies "less than"; < Signifies "more than"

**Table 48. Percent of total family income provided by the farm in relation to size of herd**

| Percent of income from farm | Statewide >20 | Statewide <100 | NW area >20 | NW area <100 | NE area >20 | NE area <100 | SW area >20 | SW area <100 | SC area >20 | SC area <100 | SE area >20 | SE area <100 | Central area >20 | Central area <100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Less than 25 | **47** | **11** | 46 | 12 | 75 | 57 | 23 | 3 | 28 | 0 | 49 | 15 | 59 | 33 |
| 26-50 | **15** | **9** | 15 | 9 | 11 | 0 | 23 | 0 | 17 | 25 | 13 | 12 | 18 | 67 |
| 51-75 | **11** | **6** | 12 | 23 | 8 | 0 | 8 | 0 | 18 | 0 | 10 | 0 | 8 | 0 |
| 76-100 | **27** | **75** | 27 | 57 | 6 | 43 | 47 | 97 | 37 | 75 | 27 | 74 | 16 | 0 |

**Table 49. Percentage of farms purchasing fertilizer for hayland and pastureland by size of herd and region of Minnesota**

| Fertilizer use | Statewide Herd size >20 | Statewide Herd size <100 | NW Herd size >20 | NW Herd size <100 | NE Herd size >20 | NE Herd size <100 | SW Herd size >20 | SW Herd size <100 | SC Herd size >20 | SC Herd size <100 | SE Herd size >20 | SE Herd size <100 | Central Herd size >20 | Central Herd size <100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hayland | **58** | **94** | 52 | 88 | 49 | 100 | 80 | 97 | 66 | 100 | 54 | 100 | 38 | 33 |
| Pastureland | **28** | **67** | 21 | 38 | 14 | 100 | 38 | 70 | 32 | 75 | 37 | 83 | 19 | 33 |

**Table 50. Time of first hay cutting in relation to size of herd and region of the state**

Percentage of respondents

| Cutting date | Statewide Herd size >20 | Statewide Herd size <100 | NW Herd size >20 | NW Herd size <100 | NE Herd size >20 | NE Herd size <100 | SW Herd size >20 | SW Herd size <100 | SC Herd size >20 | SC Herd size <100 | SE Herd size >20 | SE Herd size <100 | Central Herd size >20 | Central Herd size <100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 20-31 | **6** | **13** | 4 | 0 | 0 | 0 | 10 | 16 | 9 | 0 | 9 | 23 | 6 | 0 |
| June 1-9 | **32** | **34** | 9 | 4 | 11 | 0 | 46 | 53 | 60 | 75 | 41 | 28 | 41 | 100 |
| June 10-19 | **27** | **38** | 30 | 45 | 14 | 0 | 37 | 31 | 23 | 0 | 26 | 49 | 39 | 0 |
| June 20-30 | **21** | **10** | 38 | 32 | 31 | 43 | 4 | 0 | 5 | 25 | 19 | 0 | 10 | 0 |
| July 1-9 | **13** | **6** | 18 | 19 | 40 | 57 | 4 | 0 | 2 | 0 | 5 | 0 | 4 | 0 |
| July 10-20 | **1** | – | 3 | – | 4 | – | 0 | – | 1 | – | 0 | – | 0 | – |

**Table 51. Percentage of farms using pest control treatment, by size of herd and region of state**

Percentage reporting control used

| Pest control | Statewide Herd size >20 | Statewide Herd size <100 | NW Herd size >20 | NW Herd size <100 | NE Herd size >20 | NE Herd size <100 | SW Herd size >20 | SW Herd size <100 | SC Herd size >20 | SC Herd size <100 | SE Herd size >20 | SE Herd size <100 | Central Herd size >20 | Central Herd size <100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control lice | **69** | **100** | 81 | 100 | 59 | 100 | 75 | 100 | 62 | 100 | 65 | 100 | 62 | 100 |
| Control grubs | **28** | **70** | 34 | 77 | 23 | 100 | 33 | 57 | 22 | – | 28 | 86 | 19 | 33 |
| Control parasites (worms) | **27** | **71** | 20 | 51 | 16 | 100 | 34 | 64 | 39 | 100 | 29 | 89 | 22 | 67 |
| Control flies | **69** | **82** | 68 | 70 | 56 | 43 | 66 | 100 | 65 | 75 | 81 | 77 | 75 | 68 |

**Table 52. Percentage of herd owners ranking selected management problems in relation to size of herd and region of the state**

Problem (percent responding)

| Intensity of problem | Herd health >20 | Herd health <100 | Forage management >20 | Forage management <100 | Marketing feeders >20 | Marketing feeders <100 | Land clearing >20 | Land clearing <100 | Pasture rotation >20 | Pasture rotation <100 | Bull-cow selection >20 | Bull-cow selection <100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High | 22 | 36 | 17 | 40 | 23 | 35 | 12 | 20 | 14 | 39 | 16 | 52 |
| Medium | 33 | 27 | 44 | 40 | 37 | 26 | 16 | 21 | 34 | 29 | 34 | 25 |
| Low | 45 | 37 | 49 | 20 | 40 | 40 | 72 | 59 | 52 | 32 | 49 | 23 |

| | Pregnancy >20 | Pregnancy <100 | Calf health & management >20 | Calf health & management <100 | Farm records >20 | Farm records <100 | Facility >20 | Facility <100 | Calving >20 | Calving <100 |
|---|---|---|---|---|---|---|---|---|---|---|
| High | 12 | 18 | 20 | 38 | 13 | 29 | 30 | 45 | 8 | 17 |
| Medium | 27 | 34 | 30 | 30 | 43 | 25 | 47 | 20 | 35 | 28 |
| Low | 61 | 48 | 50 | 31 | 44 | 46 | 23 | 35 | 57 | 55 |

# SUMMARY

Twenty percent of Minnesota's farms and ranches have a beef cow-calf enterprise. Due to the normal factors influencing cattle cycles, numbers of farms and ranches with cows and numbers of cows per unit increased in the 1970's up to 1976 but have declined in 1976 and 1977. In general terms, Minnesota's beef cow-calf industry consists of 600,000 to 700,000 cows on approximately 20,000 farms or ranches. Assuming average beef cow numbers of the past 5 years with an 88 percent calf crop sold at 400 pounds at 55 cents per pound gives a gross value produced of $131,261,000.

In the fall of 1976 and winter of 1977, the Minnesota Agricultural Extension Service conducted a study of the beef cow-calf industry on Minnesota farms and ranches. The purpose of the study was to learn some detail about the nature of cow-calf enterprises and the management practices being used in the operation. A 20 percent random sample of the approximately 23,000 beef units in Minnesota was taken and a 46-question mail survey was conducted. A minimum of 300 people were contacted in each of Minnesota's 13 economic development regions. There was an approximate 50 percent response; however, only about 35 percent of the responses were complete and usable in the analysis.

To localize the information collected for purposes of designing specific Extension programs, the analysis was made on a "type of farming" or regional basis. Data in the report are in terms of the statewide situation plus six areas or regions having some similarity within but distinct from other parts of the state. Data presented are straight frequency counts and percentages with selected cross tabulations.

Based on this survey, as of January 1, 1977, approximately 45 percent of Minnesota beef herds were 20 cows or less, 50 percent consisted of 21 to 100 cows and 5 percent of herds were over 100 in number.

In Minnesota, beef cows are generally not the main source of either total income (farm and off-farm) to the family or of total income from the farm or ranch itself. Statewide, 34 percent of survey respondents had less than 25 percent of the total family income, which is derived from the farm-ranch, and 38 percent had over 75 percent of their family income from this source. When looking at the beef enterprise as a proportion of total farm or ranch sales statewide, 52 percent of respondents reported less than 25 percent and 19 percent reported over 75 percent from beef enterprises. Wide differences exist in both of these categories between regions of Minnesota. Northeast Minnesota shows 57 percent of respondents indicating above 75 percent of their farm-ranch gross income comes from beef.

One-fourth of Minnesota beef herd owners have been in that enterprise less than five years. More people are newer in the business in northeast Minnesota, and a tendency to longer-term beef cow experiences shows up in southwest and south central areas.

The liquidation phase of the beef cycle is evidenced in responses to the question on future plans. As of late 1976-early 1977, nearly one-fourth of respondents planned to sell their herds, 15 percent to reduce numbers, 43 percent remain the same, and 15 percent would expand numbers. These responses reflected the reduction phase of the beef cycle and attitudes have no doubt been modified with the 1978 improvement in beef prices.

Limitations to expansion of beef cow herds appear to center on the ability of the operator to obtain additional land and labor. This was more pronounced in the southern regions. Lack of credit was listed as a limiting factor on less than 10 percent of responses.

Selected levels of productivity were reported. April, May, March, in that order, are the peak calving months in Minnesota. There was a tendency to earlier calving periods in northern Minnesota.

About one-third of Minnesota beef calves are weaned between 350 and 400 pounds in weight. The next most common weaning weight is between 400 and 450 pounds. Little difference exists between regions on this variable.

The most common marketing age for calves was shown to be from 6 to 10 months. A higher percentage sold in the 16-20 month range in southwest and south central Minnesota reflects the fact that more calves are being placed on grain feed and sold as feed cattle by producers in those regions.

About 80 percent of herd owners provide building access for their cattle during winter. Just over 50 percent have holding-sorting pens, 35 percent a loading chute, 26 percent a headgate, 13 percent a squeeze chute, and 5 percent a scale. Differences between areas of the state do not appear significant in regard to buildings and equipment.

Performance testing is not widely practiced in Minnesota as indicated by survey response. In units with larger herds, (over 100 cows) more producers used tested bulls (53 percent) compared with herds of less than 20 cows (31 percent). Southeast Minnesota showed higher use of tested bulls in all herd size categories. Generally less than 10 percent of herds under 100 cows are on a performance testing program with their cows and calves. Statewide, operators of 21 percent of herds over 100 grade and weigh calves in a performance program.

Crossbreeding is being practiced by over 50 percent of the herd owners in all areas of Minnesota and in all herd size levels. It appears more frequently in the herds of over 100 cows.

Growth implants, a practice demonstrated to net $10 per calf in 1977, are not generally being used in Minnesota. This practice has gained more acceptance in herds over 100 in size. Statewide, 2 percent of herds under 20 cows, 6.5 percent of herds 21 to 100, and 25 percent of herds 100 or more reported using growth implants in 1976. This practice appears to have expanded considerably since the time of this study.

Pregnancy testing is being practiced on 51 percent of the herds over 100 cows, 23 percent of herds 21 to 100 in size, and 8 percent in herds of under 20 cows. It is a more common practice in northeast and southeast Minnesota.

Pest control (i.e. lice, grubs, worms, flies) was reported used by the following percentage of respondents: Statewide, 80 percent treated for lice; 72 percent for fly control; 43 percent for grubs; and 35 percent for worms.

Castration of male calves is done at varying ages of the calf. The most common time reported was at weaning, with more herds over 100 castrating at this time (54 percent) than other herd size units. Owners of smaller size herds tend to castrate at younger ages. Nearly 20 percent of small (under 20) herd owners do not castrate male calves in their herds. The pattern for dehorning is similar to castration. However, statewide, 48 percent of the respondents had polled cattle.

Minnesota beef feeder cattle, according to this survey, are most commonly sold at terminal markets or are put into the producer's own feedlot. The local sales barn is a third common method of sale, used quite frequently in southeast and central Minnesota. There were 82 percent of all respondents reporting selling their feeder cattle on a per pound basis. The northern areas showed the largest number (27 percent NE) and (25 percent NW) selling on a per head basis. Price information for beef cattle marketing is received from several sources. Radio (48 percent), other cattlemen (24 percent), and magazines (23 percent), appeared most frequently. University outlook meetings, *Northern Minnesota Beef News* and private news services were all used by less than 10 percent of the respondents as a source of information. About one-third of the respondents do not perceive having a marketing problem. Marketing problems or concerns most commonly identified were: lack of information to help decide when to sell, lack of information on my type of cattle, and marketing costs too high. There were not great differences by areas on perceived marketing problems. When presented with several ideas to improve their marketing, respondents were divided in their thinking. Holding local feeder cattle sales appealed to 50 percent of statewide respondents and 65 percent of northeast respondents. On the other hand, contracting to a local sale, or pooling cattle with other producers received low responses.

Forage, both in pasture and hay, is extremely important to the beef cow-calf enterprise. Much pastureland and potential pastureland is located in northern Minnesota, where forage production frequently is a first choice in crop production. Unimproved open pastures are found in relatively small acreages throughout Minnesota (approximately 50 percent under 40 acres). Woodland pasture tends to the same acreages; however, statewide, about 25 percent of farms and ranches reported over 80 acres in this category. Improved permanent pasture (seeded or fertilized) is also most commonly found in relatively small acreages (34 percent less than 20 acres, 27 percent 21-40 acres, and 11 percent 41-60 acres).

Alfalfa and alfalfa grass mixtures are the most commonly grown species for forages. Northeast Minnesota shows 70 percent of respondents using a clover-grass mixture for forage. That area reported 25 percent using alfalfa compared to 60 percent of southwest respondents reporting alfalfa. Timothy and bromegrass were the most commonly reported grasses statewide with 33 percent and 28 percent respectively.

In handling forage, a set of management practices was studied. The grain drill and grain drill with forage attachment are the most commonly reported (35 and 45 percent respectively) seeding equipment used in Minnesota. The press wheel drill and cultipacker seldom were used (less than 10 percent on the farms surveyed).

Manure is used on crops in nearly 90 percent of the cases and in all areas of Minnesota. It is, however, used most frequently on the grain crop (67 percent statewide, 80 percent SW and SC, 84 percent central). Manure is used on hayland by 43 percent of the respondents statewide and 21 percent on pastureland. Sixty percent of all respondents use commercial fertilizer on hayland and 31 percent on pastureland. Areas of the state varied in numbers using fertilizer on forage. Lower use was found in northeast and central areas, with higher use in all southern areas.

Weeds in hay and pastureland were considered a problem by about one-fourth of respondents, with Canada thistle being most frequently mentioned. Chemical weed control in permanent pastures was reported done on 22 percent of farms and ranches.

Hay harvesting is accomplished with the rectangular bales on about 80 percent of Minnesota farms and is used quite consistently in all areas. Large round bales are being used by 14 percent of statewide respondents but by 23 percent in northwest Minnesota.

Alfalfa management practices were reported and there are some differences in practices being used in various areas of the state. The most frequent life reported — in number of years that alfalfa lasts after seeding — is three, statewide, in all areas except northwest and northeast where the most frequent is 4 years. Time of first cutting of alfalfa most commonly reported statewide was between June 1 and 9. Southern and central Minnesota showed about half of respondents beginning first cutting before June 9; however, less than 20 percent started by this date in northwest and north central. About equal numbers reported taking two as compared to three cuttings of alfalfa in Minnesota. A large difference exists between northern Minnesota with two cuttings being more predominant and southwest and south

central with three cuttings. The most common time required to complete first cutting of hay among all respondents was one week. Northwest and northeast varied in that two weeks was the most common time reported.

When cow-calf producers were asked to indicate their level of concern on a given set of management problems, the following was reported. Marketing, forage management, buildings, corrals, and fences were listed as medium or high in levels of concern by two-thirds of respondents. In general, low level of concern was expressed toward land clearing, pasture rotation, calving problems, and open cows. However, over two-thirds of the operators with larger herds (over 100 cows) expressed medium or high concern over bull selection, pasture renovation, calf health, and management.

When the data obtained in the survey was cross tabulated according to size of herd of respondents, some definite differences are observed. Statewide, 45 percent of herds are less than 20 cows, (range is 63 percent northeast to 35 percent southwest), 50 percent are in the 21 to 100 herd size category, and five percent in herds over 100 cows.

Smaller herds showed the following in relation to larger herds:

1. A smaller percentage of farm-ranch income from beef cow herds.
2. A smaller percentage of total family income coming from the farm.
3. A smaller percentage using fertilizer on forage land.
4. A larger percentage taking first cutting of hay after June 20.
5. A smaller percentage using pest control measures.
6. A smaller percentage rating all management practices listed as a problem or concern.

# Appendix

Beef Cows, January 1

| | County | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|
| NW Area | Becker | 10,600 | 10,600 | 11,900 | 9,400 | 8,000 |
| | Clay | 10,100 | 10,100 | 10,200 | 8,200 | 7,400 |
| | Clearwater | 10,400 | 11,700 | 13,100 | 11,200 | 10,200 |
| | Kittson | 7,800 | 8,700 | 9,800 | 8,100 | 7,300 |
| | Mahnomen | 5,800 | 6,400 | 7,100 | 5,700 | 4,600 |
| | Marshall | 9,900 | 12,900 | 14,500 | 11,800 | 9,700 |
| | Norman | 9,000 | 9,000 | 9,500 | 8,000 | 7,200 |
| | Pennington | 6,100 | 8,300 | 9,300 | 6,700 | 5,600 |
| | Polk | 15,000 | 18,300 | 21,200 | 17,200 | 15,000 |
| | Red Lake | 6,300 | 7,300 | 8,200 | 6,000 | 5,000 |
| | Roseau | 11,700 | 17,200 | 20,500 | 14,800 | 13,300 |
| | Beltrami | 10,600 | 12,100 | 13,900 | 11,500 | 9,500 |
| | Cass | 9,800 | 11,000 | 12,300 | 10,300 | 8,300 |
| | Hubbard | 4,900 | 6,300 | 7,000 | 6,000 | 4,900 |
| | Lake of the Woods | 3,200 | 4,300 | 4,600 | 4,300 | 4,400 |
| | Douglas | 7,900 | 7,700 | 8,100 | 6,800 | 5,500 |
| | Grant | 3,000 | 3,600 | 3,700 | 3,100 | 2,500 |
| | Ottertail | 26,000 | 25,800 | 25,700 | 21,700 | 20,200 |
| | Pope | 10,000 | 9,700 | 10,000 | 8,400 | 6,800 |
| | Stevens | 4,600 | 6,000 | 6,400 | 5,500 | 4,500 |
| | Traverse | 4,300 | 4,100 | 4,100 | 3,400 | 2,800 |
| | Wilkin | 4,000 | 3,500 | 3,600 | 3,000 | 3,000 |
| | Morrison | 12,800 | 10,600 | 9,200 | 8,200 | 6,900 |
| | Todd | 11,300 | 11,300 | 10,800 | 9,600 | 8,700 |
| | Wadena | 4,500 | 5,000 | 6,100 | 4,600 | 3,900 |
| | Crow Wing | 4,400 | 2,600 | 2,600 | 2,300 | 2,000 |
| | Total | 224,000 | 244,100 | 263,400 | 215,800 | 187,200 |
| NE Area | Koochiching | 3,800 | 3,200 | 3,100 | 2,800 | 2,500 |
| | Itasca | 6,600 | 6,700 | 7,000 | 5,800 | 5,300 |
| | Cook | 0 | 100 | 100 | 100 | 100 |
| | Lake | 0 | 200 | 200 | 200 | 300 |
| | St. Louis | 4,600 | 4,900 | 5,500 | 5,100 | 4,700 |
| | Aitkin | 8,400 | 9,700 | 9,500 | 8,100 | 6,700 |
| | Carlton | 5,000 | 6,000 | 5,800 | 4,800 | 4,000 |
| | Chisago | 4,100 | 5,100 | 5,000 | 4,200 | 3,800 |
| | Isanti | 3,300 | 2,500 | 2,400 | 2,000 | 1,700 |
| | Kanabec | 9,600 | 10,400 | 10,200 | 9,100 | 7,600 |
| | Mille Lacs | 6,400 | 7,600 | 7,400 | 6,200 | 5,100 |
| | Pine | 10,400 | 10,700 | 10,500 | 9,300 | 7,800 |
| | Total | 62,200 | 67,100 | 66,700 | 57,700 | 49,600 |

| Continued | County | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|
| SW Area | Big Stone | 6,000 | 7,700 | 8,100 | 6,800 | 5,700 |
| | Chippewa | 4,400 | 4,800 | 5,000 | 4,100 | 3,300 |
| | Lac Qui Parle | 12,100 | 13,000 | 13,400 | 11,000 | 9,100 |
| | Swift | 8,500 | 8,800 | 9,200 | 7,900 | 6,400 |
| | Yellow Medicine | 8,900 | 10,200 | 10,700 | 9,200 | 8,500 |
| | Cottonwood | 7,600 | 9,000 | 9,800 | 8,200 | 7,300 |
| | Jackson | 9,300 | 9,400 | 10,200 | 8,000 | 6,900 |
| | Lincoln | 10,300 | 13,000 | 14,100 | 11,300 | 9,100 |
| | Lyon | 11,100 | 16,600 | 17,900 | 14,100 | 11,600 |
| | Murray | 13,400 | 13,700 | 14,700 | 12,200 | 10,600 |
| | Nobles | 10,100 | 12,000 | 13,000 | 11,000 | 9,400 |
| | Pipestone | 15,300 | 15,100 | 16,200 | 13,100 | 10,900 |
| | Redwood | 7,400 | 7,600 | 8,300 | 7,000 | 6,100 |
| | Rock | 14,600 | 15,200 | 16,400 | 12,800 | 10,700 |
| | Total | 139,000 | 156,100 | 167,000 | 136,700 | 115,600 |
| SE Area | Carver | 3,900 | 3,500 | 3,100 | 2,800 | 2,500 |
| | Scott | 4,600 | 3,400 | 3,000 | 2,600 | 2,400 |
| | Anoka | 2,100 | 1,600 | 1,600 | 1,400 | 1,200 |
| | Hennepin | 4,000 | 2,900 | 2,900 | 2,500 | 2,100 |
| | Ramsey | 0 | 0 | 0 | 100 | 200 |
| | Washington | 3,900 | 3,000 | 2,900 | 2,500 | 2,100 |
| | Freeborn | 6,000 | 7,800 | 7,600 | 6,600 | 5,700 |
| | Rice | 2,900 | 5,000 | 4,900 | 4,000 | 3,400 |
| | Steele | 2,700 | 3,200 | 3,100 | 3,000 | 2,500 |
| | Dakota | 5,300 | 4,600 | 4,300 | 3,700 | 3,400 |
| | Dodge | 5,000 | 4,700 | 4,400 | 3,900 | 3,500 |
| | Fillmore | 45,800 | 46,200 | 45,400 | 39,500 | 34,500 |
| | Goodhue | 16,200 | 15,800 | 13,600 | 12,700 | 11,000 |
| | Houston | 24,100 | 20,600 | 18,100 | 16,900 | 14,400 |
| | Mower | 11,300 | 10,000 | 8,400 | 7,300 | 6,000 |
| | Olmsted | 17,200 | 17,800 | 16,300 | 15,400 | 13,300 |
| | Wabasha | 17,900 | 17,600 | 16,200 | 15,500 | 13,400 |
| | Winona | 17,900 | 16,400 | 15,100 | 13,000 | 11,000 |
| | Total | 190,800 | 184,100 | 170,900 | 153,400 | 132,600 |
| SC Area | Kandiyohi | 6,500 | 6,400 | 6,000 | 5,600 | 4,900 |
| | McLeod | 3,600 | 3,200 | 2,800 | 2,600 | 2,200 |
| | Meeker | 4,600 | 4,700 | 4,800 | 4,300 | 3,800 |
| | Renville | 4,600 | 4,600 | 4,500 | 4,100 | 3,400 |
| | Sibley | 4,400 | 4,200 | 3,800 | 3,500 | 3,100 |
| | Blue Earth | 8,300 | 5,400 | 5,300 | 4,800 | 3,900 |
| | Brown | 3,000 | 3,300 | 3,300 | 3,000 | 2,700 |
| | Faribault | 4,500 | 4,700 | 4,600 | 4,300 | 3,600 |
| | LeSueur | 5,600 | 6,100 | 6,000 | 4,900 | 4,200 |
| | Martin | 6,100 | 4,500 | 4,400 | 4,100 | 3,400 |
| | Nicollet | 3,800 | 4,000 | 3,900 | 3,300 | 2,800 |
| | Waseca | 4,000 | 3,300 | 3,200 | 3,100 | 2,600 |
| | Watonwan | 4,600 | 4,400 | 4,300 | 3,700 | 3,300 |
| | Total | 63,600 | 58,800 | 56,900 | 51,300 | 43,900 |
| Central Area | Benton | 7,800 | 6,400 | 5,800 | 5,400 | 4,500 |
| | Sherburne | 3,800 | 3,700 | 3,300 | 3,000 | 2,700 |
| | Stearns | 9,900 | 12,000 | 12,000 | 11,300 | 9,200 |
| | Wright | 6,900 | 6,700 | 6,100 | 5,400 | 4,700 |
| | Total | 28,400 | 28,800 | 27,200 | 25,100 | 21,100 |
| State Total | | 700,000 | 739,000 | 751,000 | 640,000 | 550,000 |

*Source: Minnesota Agricultural Statistics
Minnesota Crop and Livestock Reporting Service

## A survey of Minnesota farms and Ranches with Beef Cows — 1977.

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